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MEDICUS

NEW YORK LETTERS

ON

ORTHOPEDIC SURGERY.

The Scope of Orthopedic Surgery.

TUBERCULAR ABSCESSSES AND THEIR TREATMENT.

BY

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A. C. BERLIN & Co., PRINTERS, COLUMBUS, OHIO.

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ON

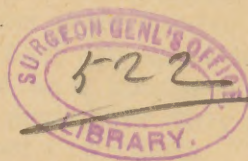
ORTHOPEDIC SURGERY

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Reprint from

COLUMBUS MEDICAL JOURNAL.

1891-2, 7,

LETTERS ON ORTHOPEDIC SURGERY.

GENERAL ORTHOPEDICS.

New York affords vast opportunities for studying any branch of medicine and surgery. Especially is this true of orthopedic surgery. During a service of some weeks, with the privileges of every orthopedic hospital and clinic in the city, I was afforded an opportunity to examine an average of about one hundred cases daily. The orthopedic service at the Vanderbilt clinic, is open from 10 to 12 daily, and has a daily average of about 15 cases. Dr. John Ridlon is orthopedic surgeon here, and I had the pleasure of serving as his assistant.

One has an opportunity here to see the methods of Dr. Hugh Owen Thomas, of Liverpool, England, practiced, as is done nowhere else in the United States. Dr. Ridlon, it appears, is especially commissioned to champion the methods of Thomas, and indeed, I may say, no doubt feels himself under the spiritual guidance of the departed sage of Liverpool.

The most commendable feature of all of Thomas' braces, etc., is their simplicity. His hip and knee braces, and all of his appliances, can be made cheaper than any other braces now in use, and, withal, they are most efficient.

Dr. Ridlon had special instruction under Dr. Thomas, and is thoroughly acquainted with his methods, and I must say I have seen some very fine results obtained from their adoption.

The Institute for Ruptured and Crippled has probably the largest out-door attendance of any institution of the kind in this country. It is not uncommon for them to have fifty cases daily. Prof. V. P. Gibney is surgeon-in-chief, and he is ably seconded by Dr. W. R. Townsend, who had charge during the early part of my service there. Their clinic is held from 1 to 3 daily.

Dr. Royal Whitman has charge of the out-door department. Dr. Wm. F. Bull is attending surgeon to the hernia department. This institution was established by the late Dr. Knight, who had in operation many plans of treatment by devices and braces, the majority of which have long since been discarded. Either Dr. Gibney or Dr. Townsend operates Tuesday and Friday mornings

at 8:30. The in-door department has an average of 180 patients, which affords quite a variety of operations, and the surgeons are very nice operators.

Drs. Gibney and Townsend also do the orthopedic work at the Polyclinic, and here there is ample material for one to study the subject pretty thoroughly.

The N. Y. Orthopedic Hospital, of which Dr. Shaffer is surgeon-in-chief, has an average daily clinic of about thirty cases. Through the kindness of Dr. T. Halsted Myers and Dr. Sam'l Ketch, I was privileged to examine cases here. It is the aim of this institution to use the knife as little as possible, and allow the mechanical treatment to have unbounded sway. Dr. Shaffer is one of the first orthopedists of the country, and has probably as remunerative a private practice as any one practicing orthopedics exclusively.

Dr. A. M. Phelps, professor of orthopedic surgery at the New York Post-Graduate Medical School and Hospital, lectures on Wednesdays and Fridays at 4:30, and his clinics are full, averaging 10 to 15.

Dr. Phelps differs somewhat from the other orthopedic men in that he is an operator; *i. e.*, he operates upon every class of cases, at the same time carrying out the mechanical treatment.

Dr. A. B. Judson's clinic, at the New York hospital, is very interesting, from the fact that the average number of cases is about five to eight, and one has an opportunity to study the cases. The Doctor is a most genial gentleman. His knowledge of practical mechanics makes it possible for him to do a great deal of the putting together and repairing of braces, which very materially leads to his success in the management of all forms of deformity.

The clinic of R. H. Sayre, at Bellevue out-door department, held on Mondays, Wednesdays and Fridays, from three to five p. m., is very interesting, from the fact that Sayre the younger, carries out the principles of his father, besides embodying more modern methods. I believe that R. H. Sayre does the most beautiful plaster work of anyone in this country. His jackets are models of perfection in fit and workmanship.

At the Bellevue clinic there is an average of about twenty cases. The senior Sayre is so afflicted and deformed with rheumatism that active work is out of the question. Strange, indeed, that one who has done so much for the deformed, should be tortured by a similar affliction.

I shall never forget the very kind treatment received at the hands of Dr. Sayre in his office where I was privileged to examine his private cases.

My purpose in these letters is to present the methods of practice in the different clinics and hospitals, illustrating the brace or appliance used by a cut when possible, so that a comparison can be made, and if I should catch myself comparing, criticising or finding fault, I would have you remember that I do not want to influence my readers, but am only expressing my opinion.

The opportunities afforded for the study of this class of cases are beyond comprehension, and as a matter of fact, entirely too much material is presented to make a critical study of cases or class of cases.

The most interesting table of statistics imaginable might be furnished the profession by following these clinics for years, and then making a comparative table. As it is, the only statistics furnished us are given by individuals, and generally from private or selected cases. Dr. Sayre, a few weeks ago, reported over 400 cases of hip disease, with six deaths, and with, I believe, about 20 per cent. of practically perfect recoveries. Such figures may be found in private practice, but never at a clinic under present methods of treatment. In private practice, the patients are more intelligent, and carry out the surgeon's desires more faithfully; besides, they are able to buy comforts that are not furnished dispensary patients.

It is most frightful to parents to have you tell them that their child has a hip or a Pott's disease, or a tubercular knee or elbow, and that it will likely have to be under active treatment for two, three or four years, and under observation for ten or twelve years, but such is the case in clinical practice.

While orthopedic surgery should be considered a sufficiently limited specialty, I find that men are given to making still further subdivisions; *i. e.* in one clinic better results are obtained in hip disease; another excels in club-foot, and another emphasises Pott's or lateral curvature. Now this is not intentional, but rather accidental; or it may not exist at all; but in my rounds, I have been struck with the results in hip treatment at one place, and I get better points in the management of club-foot at another, etc.

The question of when to operate and when to depend upon mechanical appliances, is of considerable moment to the patient, but not at all agreed upon by different surgeons.

An orthopedic surgeon, considered in its broadest sense, is one who not only does all orthopedic operations, from excisions down to tenotomies, but who is also able to execute in detail

the mechanical treatment. Not all of the orthopedic surgeons operate, and some who consider themselves orthopedic surgeons have no mechanical knowledge or ideas. The one who has in his "make up" both of these qualities, must be considered the safest man. To illustrate—I saw a child with hip disease, who presented every indication for a tenotomy of the *adductors* and *tensor vaginae femoris* considered from an operator's standpoint; but, under an anesthetic, the muscles completely yielded, and no operation was necessary. I also saw two other cases, upon which an operator had decided to do a Gant operation (osteotomy of femur below trochanter major for ankylosis of hip), but, under ether, the ankylosis did not exist, and tenotomy restored the limb to normal position.

The orthopedic mechanic would doubtless have waited in all these cases, but the operator became impatient.

The handling of tubercular abscesses following Pott's and hip diseases, is under discussion. This subject I will discuss at length in another paper, and I desire at this time to say that opinions differ from one extreme of opening every abscess that comes, to the non-interference in any case, preferring to allow them to open spontaneously.

In practice one is frequently asked what brace one uses in hip cases, or what jacket one used, or what would you recommend as the best brace for lateral curvature, or what club-foot shoe do you use, etc. Those who have not made mechanical orthopedics a study, are too often inclined to think that a brace, if made and used for hip-joint disease, is good for all cases, without variation. Especially is this true with doctors without natural mechanical ingenuity. But, as we never find two cases of typhoid just alike, so do no two cases of hip disease run exactly the same course. The same must be said of all orthopedic practice. For instance, while the Judson club-foot shoe is pretty generally used here, it is not applicable to all cases. A surgeon must treat symptoms, as is done in typhoid, and if he does not understand the symptoms and the remedy for the same, it is useless to try to treat the condition. What will keep an equino-varus at a right angle in one case, will not do so in another.

Successful orthopedic practice depends then upon :

1. A knowledge of the affected structures in health and disease.
2. Sufficient mechanical ingenuity to devise means to restore the pathological to the normal.

I do not desire to have it understood that after such important structures as the hip, knee and spine are in ostitis, or a foot is distorted to a marked equino-varus, that in these cases a normal condition can ever again be expected, but these cases can, if seen early and the various symptoms combated, be given a better chance to be restored to a normal condition.

One frequently sees cases that have been neglected for years, and in such the results cannot be compared to those receiving early and vigorous treatment.

I saw a hip case in the Vanderbilt clinic, with three sinuses, and giving a history of twelve years without treatment. Another case at Institute for Ruptured and Crippled, that gave a history of six years, and a diagnosis had never been made.

1891-2, 7, 550-556,

HIP JOINT SPLINTS NOW IN USE IN THE VARIOUS HOSPITALS.

Sayre did a remarkable thing when he developed the principle of the ratchet and key traction in the treatment of hip diseases. He made a second stride when he began the use of plaster-of-Paris.

Taylor made another wonderful stride when he extended the traction brace below the foot, serving as a support for the body in walking.

Thomas made another wonderful stride when he devised his splint, which immobilizes the joint.

Phelps did a more wonderful thing when he developed his splint, which is a happy combination of Sayre, the Taylor and Thomas ideas, and in addition to all these he adds lateral traction.

In looking over the history of hip splints, I find very little variation in the practice during the past thirty years, except during the past few years what is known as the "American Hip Splint" * was described by Dr. Henry G. Davis and Dr. Lewis A. Sayre, both in the same issue of the *American Medical Monthly*, in 1860. In these articles two points, viz: Ischiatic or perineal support, with extension by means of adhesive straps from the leg, were described in both papers. In the many modifications that have been made up to this time, these two points have been the prominent features.

To Dr. Edmund Andrews, of Chicago, and Dr. C. Fayette Taylor, of New York, is due the credit of extending the splint beyond the foot so as to take the weight of the body from the diseased joint. Dr. Taylor describes the ratchet and key method of extension in his monograph, published in 1873.

The splints used in the various hospitals in New York City in the treatment of hip joint diseases at the present time, are described and illustrated in the following pages. What is known as the Polyclinic splint is the most universally used brace in the treatment of hip joint disease. As is shown in the cut (No. 1) it is composed of a long external upright bar, extending above from a pelvic band to two or three inches below the foot. The pelvic

*Dr. A. B. Judson, N. Y Transactions, 9th International Medical Congress.

band is secured at right angle to the upright and passes around the pelvis in front and back to a point half way from the median



No. 1. (Polyclinic.)

line to *anterior superior* spine. In this brace two perineal bands are used and are secured to the pelvic band by buckles. Just above the knee is a band of iron to hold the leg parallel with the brace. At the lower end the brace is bent across under the foot, and after being covered with sole-leather, serves to walk on. Traction is made by adhesive straps along the outer and inner sides of the leg, allowing them to extend from just above the shoe-top to near the perineum. A strap running from the foot piece is secured in buckles attached to the lower ends of the adhesive straps. The leg is held in the brace by two straps, one above the knee and one at the shoe top. This brace is and has been used at the Institution for Ruptured and Crippled almost universally. It is also used at the Polyclinic. I have been unable to get any one to father this brace, but it is no doubt a modification of Dr. Judson's brace. This brace produces traction, and in a measure, secures the limb. It does not hold the hip quiet, neither does it prevent angular deformity. I had opportunity to examine a great number of cases using the Polyclinic splint under Dr. Whitman, and the results obtained in many cases are very satisfactory.

In order to prevent angular deformity, a miniature, or short Thomas is used along with the Polyclinic. This combination it seems to me, is a most desirable one, and secures : 1, Traction, 2, Immobilization, to my mind the essentials in the successful management of these troubles. A cork sole is worn on the well foot in order to make the diseased member pendant.

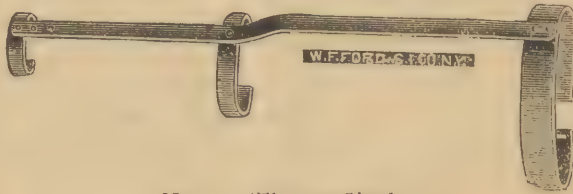
In the Clinic I saw in one day four new cases of hip disease in babies under one year, with the disease in its earliest possible stage, and it is not unusual to have 10 to 15 hip cases daily.

Dr. A. B. Judson, of the New York Hospital, has a splint in some respects similar to the Polyclinic splint. It differs, however, in that he has but one perineal band and he does not use buckles to secure the perineal strap to the pelvic band. This is done so that the patient has less chance to loosen buckles and

thus diminish the desired amount of traction. The pelvic bands are made of hard rubber and are interchangeable.

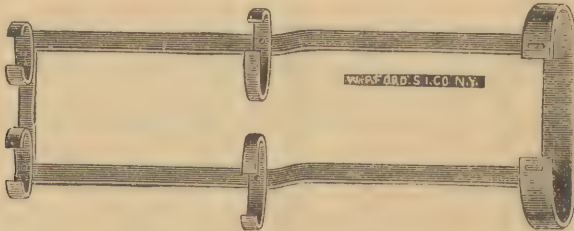
Through the courtesy of Dr. Judson, I had the privileges of his clinics and was enabled to make careful examination of his cases, and his results were very good, indeed. In one case that was passing through the experimental period in view of discarding the brace, there was no angular deformity, with very fair motion. This case had abscesses which made a voluntary opening.

To my mind the greatest advance made in the treatment of hip disease in a dozen years, is the introduction into this country of the splint devised and used by Dr. Hugh Owen Thomas, of



No. 2. (Thomas Single.)

Liverpool, England, and which bears his name. The Thomas splint has a champion in Dr. John Ridlon, who believes not only in the hip splint of Thomas, but in all other of the innumerable original methods of this mechanical surgeon. The Thomas splint, as shown in figures 2 and 3, completely immobilizes the joint. It prevents angular deformity, but it does not produce traction, and those who believe in traction in the treatment of hip disease, are either slow to adopt the brace, or if they desire



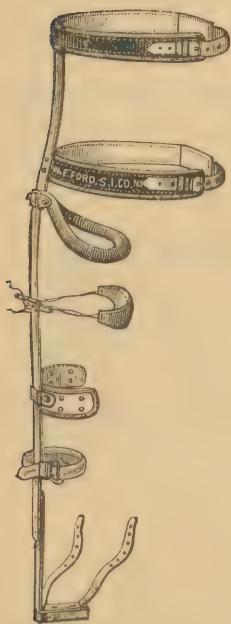
No. 3. (Thomas Double.)

the immobilization feature, are found to extend the bar below the foot in order to make traction. This improvement has been made by Bradford and others.

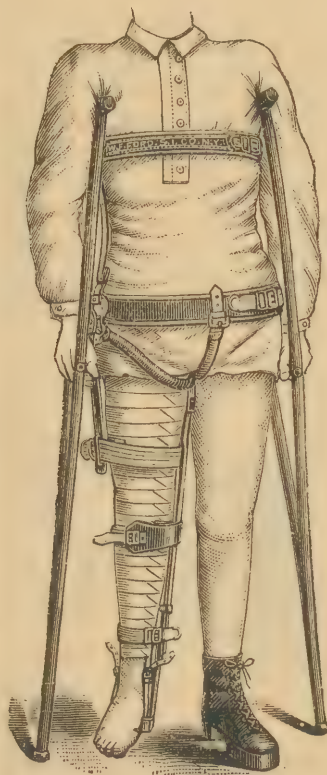
Dr. Thomas advises the use of a patten on the well foot about two inches high, with the use of crutches,

During my service of some weeks with Dr. Ridlon, I did not see one case in which he used the patten or crutches. This is rather experimental on the part of Dr. Ridlon, and apparently tempting Providence. Nevertheless, he is getting good results.

The Thomas splint in the hands of Dr. Ridlon certainly does good work. He is able to prevent flexion, or if flexion exists when treatment is begun, the splint is bent almost to the angle of flexion, and gradually brought down to complete extension. In cases of adduction or abduction, a band is thrown around the side of the body from the upright, and this deformity can be controlled. If rotation exists, Dr. Ridlon extends the upright bar down around the heel and foot to the toes, and a shoe over this controls this deformity. For those who desire to immobilize the joint in these cases, the Thomas splint is undoubtedly the best.



No. 4. (Phelps.)



No. 5. (Phelps.)

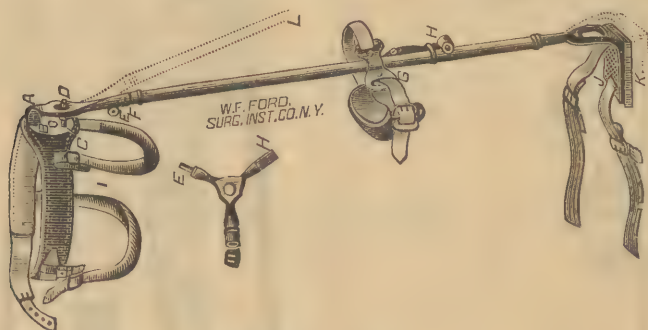
Dr. A. M. Phelps, Prof. of Orthopedic Surgery at the New York Post-graduate School and Hospital, has succeeded in

making a combination of the leading features of all the hip splints. His splint immobilizes as does the Thomas, but in my opinion not as effectually, because his upright bar is along the outside of the trochanter and body instead of posteriorly as in the Thomas. Phelps' splint makes traction in about the same manner as does the Polyclinic, the Judson, the splint used by Dr. Shaffer. All of these have the extension beyond the foot, and require either crutches or a patten.

Cut 4 shows the Phelps splint with external upright and lateral traction band. No. 5 shows the same applied except the upright bar is on the inside of the leg instead of the outside.

Dr. Shaffer, who is surgeon-in-chief to the N. Y. Orthopedic Hospital, and Orthopedic Surgeon to St. Luke's, uses a splint which is constructed very much after the style of the Judson. It has a ratchet-and-key extension, as has the Sayre and the Judson. Dr. T. Halstead Myers, Dr. Shaffer's assistant, is using a spiral spring to produce traction in addition to the ratchet traction. This, to my mind, is a step in the right direction. Drs. Gibney and Townsend use exclusively the Polyclinic splint in advanced cases, and the plaster-of-Paris spica in early cases. They treat more hip cases than any one else in this country, and while the Polyclinic splint is generally used, other methods of treatment are seen at the Clinic.

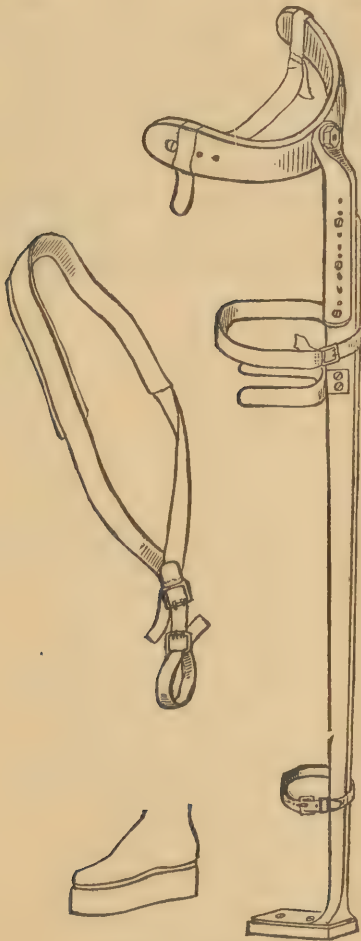
The Sayre brace, known to every one in this country and many foreign lands, is not used outside of the Bellevue Clinic. The principle of traction is afforded by the use of this splint,



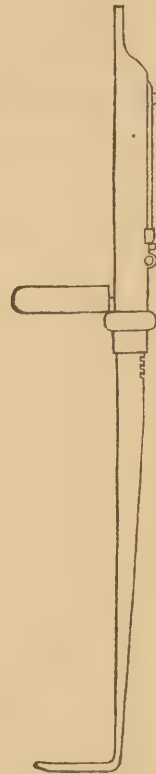
No. 6. (Sayre.)

with articular motion, and is the only one of the many splints used in New York that does allow free motion of the joint, and this is one of the principles of the splint, which, as you will observe, is not desirable in the use of other methods, but objectionable.

One of the best orthopedic surgeons said to me in talking about "his" splint, that a professor of orthopedic surgery in a western medical college, after having examined into the merits of the various appliances devised for the same purpose, said: "You may send me your splint for I want to use it in my practice. It suits me exactly." This, if taken literally, is to my notion evidence of a lack of mechanical ingenuity on the part of the western professor. I am inclined to think that no one can practice orthopedic surgery successfully and adopt any stereotyped method, any more than can a general surgeon do two abdominal sections exactly alike. No two cases are exactly alike, and hence they must be treated as individual cases with the varying symptoms. I do not mean to say that one must



No. 7. (Judson.)



No. 8. (Judson.)

devise a new splint for every case treated, but I do say that unless the case is studied *per se*, the best results cannot be expected.

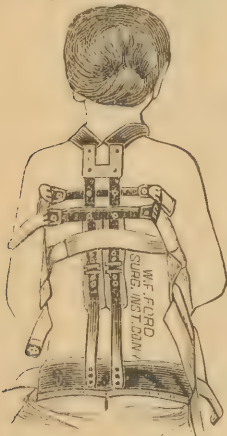
The question of the proper time to discard a hip brace is one that requires more consideration than to make a diagnosis. If the brace is removed too soon, the old trouble, possibly latent, and which under the continued use of a brace would go on to recovery, will return and the same course of abscesses, etc. will continue for months or years. The only brief rule is to remove the brace and make daily examinations of the limb. If angular deformity does not increase, the case may be pronounced cured. If, however, angular deformity does increase, the brace should be re-applied.

Cut No. 7 shows the Judson Hip Splint. This is one of the most durable of all perineal crutches. They cost much more than the Polyclinic splint, but if used as Dr. Judson uses them, they are much cheaper in the long run. He has a complete set of these splints, and only rents them to his patients; when they grow out of one, he gives them a larger one, and reclaims the discarded one. In addition to the hip splint which is furnished with a ratchet and key extension, cut No. 8 shows the Judson perineal crutch, to be used for convalescent hip cases.

SPINAL SUPPORTS.

The operation of laminectomy, as performed by various surgeons in fracture of the vertebra and for pressure-myelitis, as in the case of Dr. Phelps (which case I had the pleasure of seeing a number of times), and the wiring of the spinous processes of the vertebra as was practiced by Dr. Hadra, of Galveston, has marked a new area in the treatment of the many troublesome diseases and injuries of the spinal column.

The Taylor spinal brace, described so many years ago, and the plaster of Paris jacket, first used by Dr. Sayre a quarter of a century ago, are still in common use in the various orthopedic clinics of New York. True, there have been some modifications and changes that are considered by some as improvements upon these two pioneer spinal supports, but the principles remain pretty much the same.



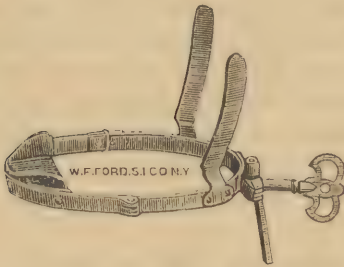
No. 9. (Taylor.)

Cut No. 9 shows a Taylor brace. This is made of an upright spinal support composed of two 1-8 inch by 1 inch iron strips, along either side of the spinous processes. The two bars are placed about three inches apart; a pelvic band passes around on a level with the ant. sup. spines, and extends half way around the body. The brace extends somewhat above the vertebra prominens, with two bands over the shoulder. An apron is worn over the sternum and abdomen is held to the brace by five bands of webbing. This, with the other metallic braces, with varying modifications of the Taylor as used in the hospitals, it appears to me, fall short of doing good work. This

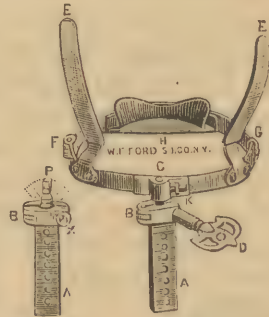
brace unquestionably does prevent lateral deviation of the spinal column, but in the majority of the cases that came under my observation, the kyphos went on increasing, and as the pressure appeared to increase at the point of curvature, the doctor with his admirable twistors was ever ready to conform the brace to the spine, and thus week after week, and little by little, the deformity grew worse. The apron, anteriorly made of canvass, to my notion is illy fitted to prevent pigeon breast deformity. I may expect too much, but it does appear to me that the support

given to the spine by an unyielding appliance, so adjusted as not to make pressure upon the kyphos, but instead evenly conform to the pelvis and thorax, especially the lower portion of the sternum, would give us better results and prevent pigeon breast deformity.

No. 10 and 11 show Shaffer's ball-and-socket head support, which is attached to the upper end of a Taylor brace. While the axis of rotation is not that of the spine, it has less opposition than the jury mast, because it is not so conspicuous.



No 10. (Schaffer's.)



No 11. (Schaffer's.)

Dr. Royal Whitman has made some attachments to the Taylor brace to prevent unnecessary deformity in Pott's disease, described by him as follows:

"Two saucer-shaped pads of hard rubber are moulded on plaster casts to entirely cover the prominence of the shoulders, resting on the deltoid muscle as it arches over the head of the humerus. These are connected by an unyielding steel bar which crosses but does not press upon the chest.

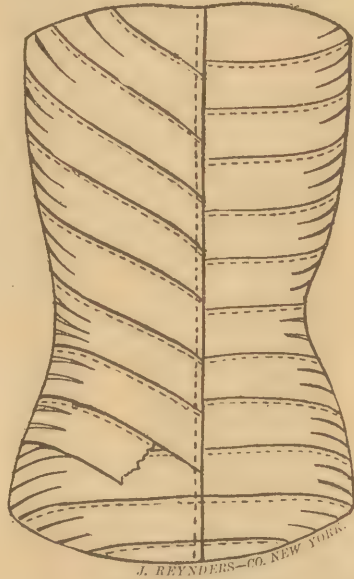
"A cross-bar is attached to the upper part of the back-brace, terminating in two triangular hard rubber pads, which cover and hold the scapulæ against the thoracic wall. The brace is then applied as ordinarily, providing efficient pressure by its pads at the point of disease. The shoulders are then brought back to their full limit; the shoulder-pads are placed in position and firmly attached to the brace by a band passing above the clavicle to the neck-piece, while another, thickly padded, is carried through the buckle on the scapula-pad, so that the shoulders are firmly held in the desired position."

The plaster-of-Paris jacket is used exclusively by the Sayres, (Fig. 12), in private practice as well as in the Bellevue dispensary work, and by Dr. Phelps at the Post-graduate Hospital and

Dispensary work. I asked a gentleman who was applying a plaster-of-Paris jacket to a patient that had a middle dorsal disease well advanced, where his pigeon breast was. He smiled, and said he did not have pigeon breast with plaster jackets.



No. 12. (Sayre.)



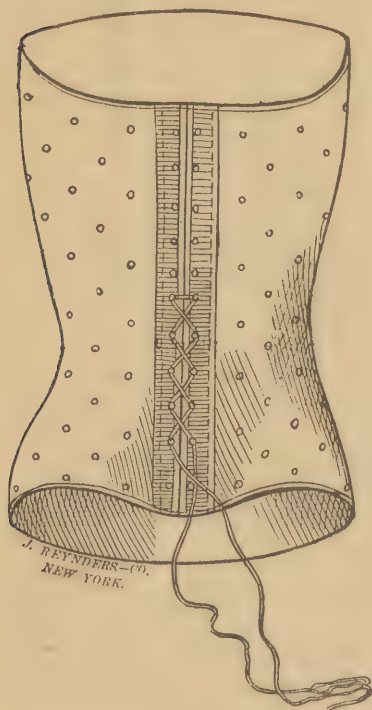
No. 13. (Phelps.)

Dr. Phelps has been using a wood corset, which he went all the way to Odessa to learn how to make. While the wood corset (Nos. 13 and 14) is a very light and altogether an admirable spinal support, it will not, I venture to say, come into general use, because of the fact that it takes Dr. Phelps one solid day of hard labor to make one, besides it is much more expensive than plaster, leather, or any other support.

As a matter of fact, the practice in New York appears to have been established by a decree issued a quarter of a century ago by Drs. Taylor and Sayre, and none have thought best to institute an opposing crusade against the methods of these gentlemen, and I doubt the necessity of doing so.

Dr. Phelps puts on a plaster jacket in cases of Pott's, and very seldom removes it for six months. I saw one that had been on for ten months without doing great damage, although the case was neglected by friends and the doctor had no chance to remove the jacket.

Lateral curvature is treated by forcible and systematic gymnastics, practiced three to six times weekly, and by the use of plaster-of-Paris jacket to retain the correction obtained by the forcible replacing of the distortion. The correction, of course, is made by breaking up the adhesions in the spinal anchylosis with sufficient force to get crackling, and is necessarily a very slow process, but wonderful results are sometimes obtained in this way.



No. 14. (Phelps.)

gymnastics in the other; and for this reason a diagnosis is of great importance.

I saw a case that was "going the rounds" of the Clinics that was called Pott's at one and lateral curvature at another, and during my service the opposition never came together.

Statistics show that about 50 per cent. of vertebral caries have abscesses that make their appearance either along the spine or in the pelvis. It is not uncommon for these accumulations of pus to be so extensive as to entirely fill up the iliac fossa to the mesial line on the affected side.

Methods of treatment of these abscesses are far from being settled. I saw Dr. Phelps open an abscess at Poupart's liga-

Dr. Shaffer has a brace which he uses in his private practice, as well as in the New York Orthopedic Hospital, which it is claimed not only retains that degree of correction obtained by forcible gymnastics, but has a constant influence in correcting the curvature.

Dr. Taylor's private hospital on 54th street is fitted up with every mechanical appliance for the treatment of the deformed, and especially is this true of his appliances for the treatment of lateral curvature and other paralytic deformities.

It must be remembered that Pott's disease, which is a destruction of the bodies of the vertebra, and lateral curvature, which is a paralysis of the *erector spine* and other muscles that tend to support the spine, are very different diseases and the indications for treatment are just opposite, fixation in one and

ment, and push a drainage tube up along the sinus toward the diseased area, which was in the lower dorsal region, for a distance of twelve inches. The tube was withdrawn a little at every dressing.

Dr. Townsend is a believer in making free opening into all these tuberculous cavities, and curetting the entire sack wall.

Dr. Sayre uses as a local application, the following :

Aristol.....	1 part.
Lanolin.....	8 parts.

This has undoubted value in promoting the absorption of tuberculous deposits. When the abscess makes a spontaneous opening, the cavity is first injected with peroxide of hydrogen (Pure 15 vol.), followed with an injection of 10 per cent. solution of Iodoformized oil, or glycerine. This injection is made two or three times every week. Extensive pus cavities are seen to rapidly close under this treatment.

CLUB FOOT—MISCELLANEOUS SUBJECTS.

One of the most sweeping advances made in the treatment of club foot that came to my notice while in the New York hospitals, is an operation practiced by Dr. Phelps which he calls the "open operation." His rule, as he expresses it, is to "cut the contracted parts as they first offer resistance, cutting in the order of those parts which first contracted when the deformity was produced." The foregoing law means that the tendo-achillis should be tenotomized first, then the plantar fascia, skin, etc.; the incision extending from a short distance anterior to the internal malleolus down across the sole of the foot to the bone, if need be, and cutting every ligamentous resistance including the deltoid ligament. Such an operation makes a ghastly wound, about four inches long in some cases, but as I saw the cases in Dr. Phelps's Clinic, they healed promptly with a foot that was straight.

Dr. Gibney favors the removal of the astragalus rather than the Phelps operation, and I saw him do a number of such operations. Invariably the astragalus was found with the superior articulating facet upon the posterior surface. It has occurred to me that in cases of equino-varus, where the astragalus has been dislocated for, it may be, fifteen or twenty years and the normal articulating facets obliterated and new ones formed, thus creating as it were entirely new relationships in the ankle joint, it would be difficult with the Phelps operation to push the astragalus back between the end of the tibia and os-calcis. This is doubtless possible with Dr. Phelps, but Dr. Gibney gets a very serviceable ankle by the enucleation of the astragalus.

There are a number of devices to produce forcible correction of feet in talipes. Dr. Shaffer has a very effective extension apparatus (Fig. 15,) which is manipulated by two keys; one to control the varus and the other to overcome the equinus. This has considerable power, and, indeed, in ordinary cases, when it is used as Dr. Shaffer and his assistants (Drs. Myers & Ketch,) use it, it is quite effective. They practice forcible stretching of the contracted tissues two or three times every week; and in the meantime wear a retaining shoe. When it is desired to use great force, and rupture all resisting ligaments and place the foot in a super-

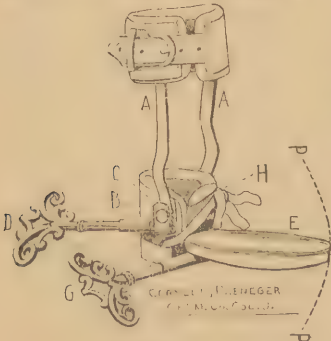


Fig. 15.

corrected position at one sitting, some more powerful machine is necessary. Dr. Townsend and Dr. Gibney use what is known as "the T. T's." (Thomas Twisters). Dr. Phelps has devised a machine that he claims has a power of many tons, and he has no difficulty in putting any deformed foot into position. Dr. Henry Ling Taylor treats club foot by what he calls "continuous leverage." His method is shown in (Fig 16 and 17.) "It consists in its commonest form, in a steel shank with guarded leg and ankle bands, pivoted to a foot-piece of thin steel. The foot-piece has a sole-plate and a side-plate fitted to the inside of the foot; there is a screw stop at the ankle joint to flex the ankle, and there are straps across the instep which are guarded by a small steel bar. The shank is not usually pivoted directly to the foot-plate but to a steel H piece which makes an offset from the ankle.

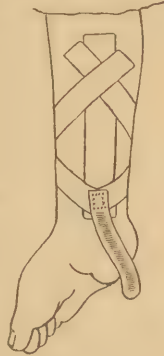


Fig. 16.



Fig. 17.

The shank of this instrument is easily bent by the hand or by wrenches according to the requirements of the case. About 1874, he (Dr. C. F. Taylor) began to apply a three tailed adhesive plaster to the leg, a piece of webbing attached to the plaster was buckled to the heel of the apparatus. This kept the heel from leaving the sole-plate when force was applied, and greatly increased precision."

Dr. Judson believes, as was taught and practiced by Dr. Taylor (Fig. 18,) and afterwards modified by Dr. Shaffer, that in young patients the varus should first be corrected and the equinus afterwards.



Fig. 18.

Dr. Judson, however, has introduced a very simple and inexpensive splint for overcoming the varus, which he uses exclusively during the first year, or until the patient is old enough to walk. (Fig. 19 and 20.) This brace can be made by any mechanic and can be adjusted by any doctor. This accomplishes in a much simpler way just what is done by the Shaffer-Taylor brace (Fig. 18).

The most universally used club foot shoe in New York is the Judson, shown in (Fig. 21 and 22). It is simply constructed, and has no ankle joint. The foot is placed on the shoe, and one strap holds the toe down on the sole and from turning

inward, and the second holds the heel down from being pushed backwards.

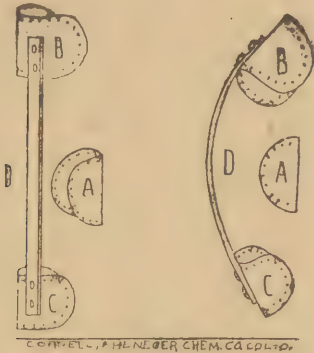


Fig. 19.

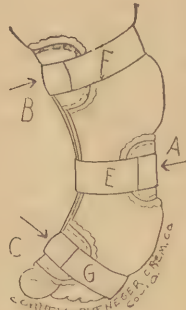


Fig. 20.

A great advantage in the Judson shoe is that it can be worn inside of the ordinary shoe, which does away with the unsightly appearance of artificial tendons and other conspicuous machinery. In making a brace without an ankle joint, the Dr. shows his faith in the uselessness of foot flexion as an essential to graceful walking.

Dr. Judson showed me a very ingenious contrivance which he constructed, in order to demonstrate clearly the severity of



Fig. 21.



Fig. 22.

the strain which falls on the muscles of the calf and the tendo Achillis. He made a machine in which wooden sticks represent

the leg and the foot, and a spring balance the tendo Achillis. The weight of the body is represented by a bag of shot weighing four pounds. The machine can be balanced in an upright position for an indefinite time by a light touch of the hand, and the joint representing the ankle is adjustable at any point between the heel and the toe. On trial of the machine the spring balance is seen to vary in its registry when the joint representing the ankle is moved to a new point between the heel and the toe. When it is near the toe, the balance registers a small fraction of a pound, and when it is at a point near the heel the balance indicated twenty or twenty-four pounds, the limit of the scale. The Dr. makes the foregoing demonstration to prove the impracticability of Willit's operation, of shortening the tendo Achillis in paralytic talipes calcaneus.

Dr. Gibney has been doing this operation very extensively and reports quite a number of cases that were permanently benefitted by it.

Dr. Townsend has made a study of the cases that have been treated in the Institute for the Ruptured and Crippled, 2386 cases in all, and concludes his study as follows:

Equino-varus the most frequent deformity, constituting about three-quarters of all the cases.

Both feet more often affected than one.

Right foot more often affected than the left.

Non-congenital club-foot most frequently due to paralysis.

The paralytic forms usually due to poliomyelitis.

One foot more often affected than both.

Flat-foot more commonly affects both feet.

Males and females about equally affected in non-congenital club-foot.

Equino varus, equinus and calcaneus most common forms of paralytic club-foot.

When both feet are affected the deformity is usually the same in each foot.

Equinus and calcaneus are rare as congenital deformities, but common as paralytic.

MISCELLANEOUS SUBJECTS.

The details of orthopedic practice are only learned by a constant and daily study of the methods of those who have followed this specialty for years. It is a knowledge of the little things that prepares one for successful practice, and a lack of them that handicaps one and increases his work many fold.

The mode of applying plasters to produce extension in hip cases; the manner of dressing pressure sores, and the means resorted to to avoid them; the adjustment of club-foot shoes; the question of removal of braces; a knowledge of plaster-of-Paris work, and the methods of padding for a jacket, and of finishing a jacket, are all questions of vital importance to one desiring to do any orthopedic work, and if not learned in clinics where long years of experience have reduced the detailed work to simplicity and perfection, it must necessarily require years of diligent study of text books and of practice, and then I doubt whether any degree of perfection can be commanded. I am a firm believer in specialization, and am also convinced that one should not undertake to do that which he is not prepared to do.

The question of preparation is something, but the question of natural inherent faculty is another, and to my mind the latter is the greatest endowment a man can possess. We are more liable to think we know what we may not know well; than to know what we do not know.

This is very applicable to those who, unfortunately having no mechanical ideas, try to adjust orthopedic machinery. One must admire the skill shown in the adjustment of braces for the correction of deformities, by mechanics who have no knowledge of the pathology of the distortion. One also has frequent occasion to experience a disgusting disappointment in seeing a brace hung on a patient like a bird cage on a clothes horse, and with about as much of the original idea displayed in the adjustment, by doctors who ought to display more mechanical genius.

We can not all have the faculty of mechanical ingenuity, any more than all can be orators; but, to revert to a former proposition, we *should* know what we do not know and ask some one to step up that has shown particular fitness for a given work. One who watches Sayre, the younger, put on a plaster-of-Paris jacket must admire the work as he would be enchanted by the oratory of a Webster, or the melody of Bethoven. He does most admirable work. His natural tact, and his qualification by years of work with his father, fit him for such work.

One must admire the mechanical skill shown by Dr. Judson in not only devising new instruments and modes to illustrate pathological and mechanical truths, but in being prepared with his vise, hammer, file, etc., as a part of his own outfit.

I was very much interested in the work done by Dr. Whitman in the treatment of that very painful and obstinate condition known as flat-foot. He assumes that the sole of the foot is

described by an angular line running from the toes to the heel, the apex of which angle normally points externally at the highest point of the arch, and in aggravated flat-foot the apex of the angle points toward the other foot. To restore this dislocation, Dr. Whitman breaks up the adhesions which hold the foot in the abnormal condition, forces the toes and tarsus downward and inward until the normal angle is restored, and holds the foot in the corrected position with plaster-of-Paris until the sprain which would result from the force has gotten well. A cast of the foot is then taken in plaster-of-Paris, and an iron casting made from this. Over the iron casting a steel shank is formed which reaches from the middle of the heel to about the middle of the tarsal bones, and up on both sides of the instep. This is worn inside of any shoe and takes up about as much room as an ordinary insole. To my mind this is a most common-sense treatment.

The common-sense methods of Thomas, as practiced by Dr. Ridlon, command respect and attention. The prime principle of Thomas was that rest is the first indication where pain exists. I saw a case of synovitis of the elbow joint following a fracture in which the attending physician practiced passive motion under an anesthetic twice every week, and daily manipulation for months, with the idea that rest would result in ankylosis and that passive motion was necessary to prevent a stiff joint. This case came to Dr. Ridlon with a most severe synovitis, great tumefaction, etc., and the wrist was haltered to the neck and the halter shortened as it could be done. In a few weeks the inflammation subsided, pain disappeared, and the patient was discharged with a complete recovery, barring the limit in motion to 45 degrees.

Tubercular synovitis of the great toe, Dr. Ridlon puts up in plaster-of-Paris and puts the foot on a wooden clog, allowing the effected toe to project over the end of the clog.

Through the kindness of Dr. Townsend, I had the pleasure of making a very thorough examination of a case of Charcot's disease. The case presented the characteristic tabetic symptoms as well as the joint disease. The external portion of the head of the tibia had worn away so as to allow the femur to drop down alongside the head of the tibia for about one inch. This made the knee about twice its normal breadth and the leg was thrown out like a case of knock knee. The symptoms referable to the disease in the spinal cord are almost in every respect like those of *locomotor ataxia*. This case and one in Dr. Ridlon's clinic,

were the only cases I learned of during my stay in the city. It is a very rare condition.

In the wards of the Institute for the Ruptured and Crippled, I saw a case of general osteo-malacia. Dr. Townsend was trying to fracture the humerus to straighten it, and the bone snapped in three places. The patient was wearing a double long Thomas' splint with extension.

In cases of paraplegia due to pressure myelitis, the above hospital uses the Flemming extension, which is made essentially of a head band secured to the head of the bed as a counter extension, and a pelvic band continuous with a weight extension over the foot of the bed.

Dr. Ridlon formulates a rule for differentiating torticollis from cervical caries, viz: In torticollis the chin points from the prominent muscle, and in caries the chin points toward the prominent muscle.

A very common, and to my mind a very reckless, practice, is that of the administration of ether in cases of suspected joint disease, and subjecting the joint to all manner of forcible and extreme manipulation. While such an examination goes far toward clearing up doubtful points in making a diagnosis, the irritation caused by forcible passive motion rekindles inflammations that might be latent, and on a fair road to recovery. Such procedure to the orthopedic surgeon is as an exploratory incision is to the laparotomist, and just as heroic and hazardous. One should be able to make a diagnosis in suspected tubercular bone or joint disease without such examinations, even in infants who are unable to answer questions.

ORTHOPEDIC SURGERY.

It is a fact that has compelled the medical profession during the last few years to recognize that no one man can conquer all branches of this grand and great science. Knowledge of all subjects is becoming more intricate, and as a result when one tries to master the details of many sciences, he falls short of thoroughness.

This has resulted in specialization. One farmer raises stock as a specialty; another delights in his crops; another grows fruit, etc., and all excel in the desire of their heart.

This is true in all branches of commercial life. The trend of the human mind is to study, and claim superior attainments in some one thing, and boast of his lack of knowledge of other things.

During my professional career, I have failed to find a professional brother who did not have a liking for one branch of his profession, and a dislike for others. This is an involuntary process, and the only wonder is that our fathers have lacked the courage to allow this principle to assert itself.

A few years ago there were but seven subdivisions in medicine. To-day there are seven times seven, and the cleavage is unchecked.

We all very naturally float into the sphere of our inclination, and I have adopted that branch of general surgery known as orthopedic surgery.

I am reminded in this connection that no one can enter a specialty and expect to have broad discriminating power, unless he has had some years experience in general practice. Prof. Osler says the "ready-made variety of specialists should be condemned;" *i. e.*, years of general work is necessary to mature one's judgment and make it possible for him to know what variety of practice he likes best and is best prepared to do.

Dr. V. P. Gibney, of New York, defines orthopedic surgery as "That department of general surgery which includes the prevention, the mechanical treatment and the operative treatment of chronic or progressive deformities."

The word orthopedic has a Greek derivation, and means straight child (*orthos*, straight; *pais*, child), instead of from

the Latin, which would mean straight feet, and thus limit the practice, etymologically at least, to the treatment of crooked feet.

Deformities may be divided as to their causes as follows: Paralytic, congenital, due to injury, due to disease.

To make a further analysis of this specialty and define more clearly the scope of work as practiced by the orthopedic specialist of to-day, we may divide the subject into those conditions that can be corrected by, first, mechano-therapy, and second, operative procedure.

Under the first head are found :

(a.) Paralytic deformities, infant paralysis, lead paralysis, lateral curvature of the spine, club-foot, flat-foot, etc.

(b.) Tubercular osteitis, hip-joint disease, Pott's disease; disease of the head and shaft of the long bones, etc.

(c.) Tubercular synovitis (knee, wrist, shoulder and ankle).

(d.) Bow-leg, knock-knee, etc.

Under the second head would very naturally come any of the foregoing conditions that would require an operation, as tenotomies, excisions of joints, resections, the curetting of tubercular abscesses, etc.

It is not unusual for one to find the subject further subdivided, and the range of practice more limited than as described above. To illustrate, I have a friend who is one of the most scientific orthopedic surgeons of this country, who does not even open an abscess or cut a tendon; and when such simple operations are necessary, he sends them to the general surgeon. This is, of course, an extreme case, but the other extreme can be found where the knife is too freely used, to my notion. A happy medium is a most pleasing position, and they are to be found. It is the custom outside of New York and Philadelphia for the orthopedic practitioner to do a more liberal practice. This specialty is yet in its infancy. At present there is but one member of the American Orthopedic Association in Ohio, and but two more that are applicants for membership. The total membership of the American Orthopedic Association is but 42.

The first requisite to the successful practice of this specialty is that one must have natural mechanical ingenuity; and without this, failure is bound to follow an entrance into the field.

The late Dr. Thomas, of Liverpool, it is claimed, had his own machine shop, and he was first known as the "blacksmith of Liverpool," but at death he was recognized as the greatest

mechanical genius that ever lived. He devised more orthopedic apparatus of merit than any other man. He was not only this, but withal a good operator.

Dr. Sayre, known to everyone as the originator of the plaster-of-Paris jacket, and the traction hip splint, has a record of doing many remarkable operations in surgery.

The orthopedic specialist must be prepared with all forms of electrical appliances for the treatment of paralysis. He must have a knowledge of massage and gymnastics, for the Swedish treatment is very valuable in developing atrophied muscles. He should have a machine shop and mechanics, or a trusty instrument maker to do his work as he desires it. A thorough knowledge of the skeleton, the ligaments and the muscles, is necessary, as well as a knowledge of muscular action. He must also know how to perform surgical operations according to modern aseptic and antiseptic ideas. A knowledge of the reparative process of bones is necessary, as well as a knowledge of the part the bacillus of tuberculosis takes in the causation of these troubles. If one wants to enter a field that has in it very brilliant things, he will not enter this. There are no brilliant operations and no rapid results, but instead, the principal work is in tinkering at some brace, working for years with a Pott's, a hip, or other chronic tubercular bone trouble. When our patients or their friends ask as to prognosis, we say 2 to 8 years of treatment, and finally the outcome will be some deformity. The laparotomist can say you will be well and ready to go home in 21 days; the oculist can say that your vision will be restored in 15 seconds; the general surgeon, your wound will heal in a few weeks without pain, suppuration or complication. The general practitioner can promise the typhoid patient that he will be better in three or four weeks; the patient with pneumonia, that resolution will take place in seven days, but the orthopedic surgeon dooms his patient to an association with him for years. Other specialist's patients either die quick or get well quick, but the orthopedic patients seldom die, and seldom make complete recoveries.

The field of labor is very uninviting, but one floats to or from it as a leaf is wafted about by the winds. Great promise can be made in these cases if seen early, and for this reason a diagnosis is of vast importance.

I am now treating a case of Pott's disease of the lumbar region, that has a history of suffering of 11 years, and the condition was never recognized. I have under my care a similar

case, with a history of a year's suffering without diagnosis. The latter case presented no signs, but by a critical analysis of symptoms and by exclusion the true condition was found, a support to the spine applied, and relief from a greater portion of the suffering followed.

I saw one case of hip-joint disease with a history of six years, without diagnosis, and another of 12 years without the true condition having been recognized. I also saw, in one day, five cases of hip-joint disease in children under one year old, and the disease in every case was in the first week.

It is very common, indeed, for ostitis to be called rheumatism, and treated as such, and while there may be some excuse for this, the general practitioner should be ever on the lookout, because when these cases go unrecognized, they result in the gravest and most frightful deformities; but if recognized early, they go through molecular disintegration, absorption, and reproduction, with a minimum of deformity.

TREATMENT OF TUBERCULAR ABSCESSSES.

My purpose will be to speak of the bacillus of tuberculosis as it invades the bones and joints, and not as it attacks the various other structures of the body, as it does in tubercular phthisis, meningitis, etc. The present doctrine of tuberculosis is based chiefly on the investigation of Virchow, and his histological definition still holds good with slight changes.

A tubercle is a new growth, in the shape of a small nodule, which always starts from the connective tissues, and is cellular from its first development. At first it has a gray, transparent look, and is frequently provided with blood vessels, but according to Virchow's opinion, with further growth, the finer vessels are entirely compressed by the aggregation of numerous small cells, and only the larger vessels, which simply pass through the tubercule, are retained. For this reason the period of vitality of the new growth is limited. Fatty metamorphosis sets in, the fluid is absorbed, the cells begin to shrivel, it becomes opaque and assumes a yellowish color, and thus begins the characteristic cheesy metamorphosis. This change, which begins in the center, soon extends to the periphery.

The malignancy of these tubercles is shown by their decided tendency to spread through the entire organism. Cheesy degeneration is no longer regarded as fatty degeneration with loss of water, but as that form of necrobiosis called coagulation necrosis, by Cohnheim and Weigert.

The discovery of Klencke and Villemin, that tuberculosis was contagious by inoculation, has completely revolutionized former doctrines and the disease must now be regarded as infectious. These doctrines have been positively established by experiments upon animals as well as by clinical observation. The discovery of Koch, in 1882, that the virus that produced tuberculosis contained a specific bacillus, has given new light upon this subject. He was able not only to cultivate the bacillus in the body, but also to cultivate the same outside of the body in an artificial medium. These specific pyogenic microorganisms make their appearance in different structures with an entirely new individuality. The most common varieties found are the staphylococcus and streptococcus, and of the former there

are five varieties. The staphylococcus aureus and albus are most frequently found in disease of the vertebral bodies, hip and epiphyses of the long bones.

With a belief in the microbic origin of phthisis, osteitis, syuovitis, lupus, and a number of the most grave pathological conditions, one has removed much doubt that would otherwise exist, and is in a position to diagnose, prognosticate and treat them more successfully. It is not believed that the bacillus of tuberculosis has the power to migrate, but is only conveyed from one part of the organism to another in the liquid channels, and thus infects other organs. All of those conditions known in the older text-books by the vague term scrofula, have been shown to be identical with tuberculosis, etiologically, clinically and anatomically. As there is possibly no one here that does not believe in the microbic origin of tuberculosis, it will not be necessary forme to enter into the methods of culture, and a description of the innumerable experiments that have been performed upon the lower animals to prove the correctness of this scientific truth.

To make my paper of some practical value to the society, I desire to report a case, and give methods of treatment in the light of the most modern methods.

R. R., aged 6, had an attack of appendicitis in January, 1892, which ran the usual course. Tumor presented in the right iliac fossa, which disappeared in a few days. Patient got about in a few days with a manifest limp. In March a hip-joint disease was diagnosed, and weight extension adjusted, which gave relief. May 6th, patient died from exhaustion due to the continued high fever. *Post mortem* revealed the old appendicitis, with a perforation of the wall of the vermiform appendix by an enterolith post peritoneal. The hip-joint bag was found to be full of bloody pus. The ligamentum teres was destroyed, and the greater part of the acetabular joint cartilage was disintegrated. The cartilage upon the posterior and inferior surface of the head of the femur was destroyed, and there was a hole into the cellular structure of the head the size of a ten-cent piece. No communication could be found between the focus at the appendix and the hip trouble. The only way to account for the secondary infection of the hip is by classing it as a tubercular trouble, and the bacillus was conveyed from the original trouble in the abdomen to the secondary focus of infection in the hip, either through the lymph channels or blood vessels. While a microscopic examination of the case was not made, the history of high fever, the characteristic limp, the relief by traction, and subsequent

post mortem, furnish positive proof of the tubercular nature of this case.

Abscesses that make their appearance in Pott's disease, in about 50 per cent. of cases, and in hip disease in about the same proportion, and known in the older text-books as cold abscesses, are now recognized as being tubercular, and an evidence of grave bone disease. In hip disease, the favorite location for the abscess to point is on the antero-external aspect of the thigh, an inch or more below the trochanter major. Abscesses following vertebral caries, if the disease be well up in the dorsal region, generally make their appearance a short distance below the affected area along the erector spinæ muscles; but when the disease is within the range of the origin of the psoas muscle, the tubercular product gravitates along along this muscle, an examination of the iliac fossa will determine the presence or absence of this complication. Not unfrequently the liquid burrows its way along the psoas and points below Poupart's ligament.

The products of these tubercular diseases, as found in subcutaneous cavities, while very like unto pus, is not pus, in that it does not contain pus cells, and only becomes purulent after it is infected by pyogenic germs, either through the source of unclean instruments, as in the case of aspiration, or after these cavities have had contact with impure surroundings after once being opened and drained. The product of tuberculosis behaves itself very differently in different individuals, and under different circumstances, and for this reason the question of the management of abscesses is now under discussion. Some very high authorities never open a tubercular abscess, but allow it to have its own course, until it opens spontaneously; while others, equally as high in authority, are inclined to open and drain every tuberculous accumulation of any considerable amount.

In a case of abscess following a dorso-lumbar Pott's, in the clinic of Dr. Phelps, I saw the Doctor open the cavity at Poupart's ligament, and insert a drainage tube up along the psoas muscle, with a uterine sound, for a distance of 12 inches. The abscess cavity was first flushed with bichloride solution 1 in 3,000.

More recent authorities advise the use of an ointment made of lanolin, 8 parts, aristol, 1 part, as a local application over these tuberculous accumulations, when it is not desirable or advisable to operate.

Dr. Senn has made an exhaustive study of the subject of the injection of tubercular accumulations, by various solutions, and he concludes his paper by saying that iodoformized oil, 10

per cent. solution, is the most valuable of all injections, and that the Balsam of Peru stands second.

Aspiration is a procedure that has long been practiced, especially in the treatment of tubercular synovitis involving the knee, shoulder, elbow, wrist and ankle joints, by the general practitioner as well as by the specialist, and great good generally follows it if practiced with strict antiseptic precautions. To do an aspiration, however, without clean instruments, is little short of malpractice, for it is better to leave tuberculous accumulations in important joints undisturbed than to remove this accumulation, which is not septic, and infect the joint cavity with suppurating micro-organisms, and less harm would follow the former than the latter.

In cases where we already have a discharging sinus communicating with tubercular bone or joint disease, such a cavity should be first injected with peroxide of hydrogen, 15 vol. pure, until the liquid has come in contact with every part of the suppurating surface. The sinus is then injected with a 10 per cent. solution of iodoform and glycerine, or sweet oil. This course should be practiced about every other day in ordinary cases.

Koch's tuberculin, which has received so much notoriety during the past few months, has turned out to be a failure; but Koch should be crowned just the same, because of his discovery of the bacillus of tuberculosis and for his investigations toward the discovery of a remedy to destroy the bacillus, and the discovery will be made without a doubt, but Koch may not live to know it.

